Optional Course

CELL SIGNALING (LS638A)

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S. No.	Topics	Contact hours	Faculty
1.	Concepts in cell signaling :- Conserved components and basic principles involved in signal transduction pathways; Studying cell surface receptors; Methods to study signal transduction; Identification of unknown interacting partners; Knockout mouse generation	4	PCR
2.	GPCR signaling : Properties and structure of G proteins, Downstream signaling like adenyl cyclase and phospholipase C, RTK signaling GPCR and RTK integration	3	PCR
3.	Cell adhesion molecules and cell signaling	1	PCR
4.	Interferon signaling and antiviral response	2	PCR
5.	Cell signaling pathways controlling gene activity:- TGF signaling, Cytokine signaling, JAK-STAT signaling, Receptor tyrosine kinases Ras and MAP Kinase pathways, Phosphoinositides and PI3Kinases	6	PCR
6.	Wnt signal transduction pathway	2	SS
7.	Hedgehog signaling	1	SS
8.	Notch signaling	1	SS
9.	Integration of signaling pathways for mesoderm induction	2	SS
10.	Integration of signaling pathways for organogenesis:- Tetrapod limb development, Vulval development in *C. elegans*	3	SS
11.	mTOR and nutrient signaling	2	SS
12.	Second messenger signaling : Involvement of cAMP signaling in the development of *Dictyostelium discoideum,* Calcium signal transduction pathway, cGMP signaling	4	SS
13.	TLRs-its signaling and diseases	1	PCR
14.	RNA transport and cell signaling	1	PCR

Suggested Reading :

1. Molecular Biology of the Cell : Bruce Alberts et. al.
2. Molecular Cell biology - Lodish et. al.
3. Signal Transduction - Gomperts, Tatham, Kramer.
4. Protein Protein Interactions - Golemis E. edted.
5. Research papers.